Switch Shanty
Delaware, Lackawanna & Western Railroad
Lackawanna County
Pennsylvania

HAER No. PA-132B

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Engineering Record
National Park Service
Department of the Interior
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HISTORIC AMERICAN ENGINEERING RECORD

Delaware, Lackawanna & Western Railroad: Scranton Yards
Switch Shanty

HAER NO. PA-132B

LOCATION: 350 feet southeast of Bridge 60
Scranton, Lackawanna County, Pennsylvania

UTM: 18/44383/458424
QUAD: Scranton

DATE OF CONSTRUCTION: 1920s (?)

CONTRACTOR: Delaware, Lackawanna & Western Railroad

PRESENT OWNER: City of Scranton

PRESENT USE: Not in use.

SIGNIFICANCE: The switch shanty functioned as a switchman's shelter and as a center of communication in the middle of the busy Scranton yards. The building is unimposing, but was necessary to the yards' operation.

HISTORIAN: Kathryn Steen
Delaware, Lackawanna & Western Railroad: Scranton Yards Recording Project, 1989

INTRODUCTION

Switches allow trains to change tracks, and are commonly used to connect main lines and branch lines. Within a rail yard, such as the Delaware, Lackawanna and Western Railroad's facilities in Scranton, Pennsylvania, a great number of switches were employed to get the trains to the fueling station, the freight platform, the passenger station, the track scales, or the roundhouse. The yard switches were thrown manually by trackmen, with the exception of those switches at either end of the yard run by interlocking mechanisms.

SWITCH SHANTY

In the railroad yard, there was a concentration of switches that had to be tended by the trackman at all times, day and night. Typically a small shanty was available for the trackman for shelter and as a base of communication.[1] Like most such shanties, the extant Scranton shanty in the D,L & W rail yard is a small rectangular wooden frame structure. There are doors on the gable ends of the building and windows on all four sides. Originally, four wooden lockers were lined against the north wall, as well as a bench with storage space underneath. There was a stove (now missing) midway along the south wall and also a second bench. On the same wall were boxes for electrical and telephone connections.

The yard master, who worked in the shanty, gave directions to the trackmen regarding movement of yard engines.[2]

SWITCHES

There are three basic types of switches. In the first quarter of the twentieth century, the split switch was the predominant type, replacing the earlier stub switch.[3] The third type of switch is the slip switch, which allows a train on a given set of tracks to cross over another set without changing tracks.[4]

The most common switch arrangement is a split switch on a track turnout. A turnout is simply where one track veers off from another, so that a train facing the turnout switch can choose one of two diverging tracks. Sometimes a series of turnouts are lined up one after the other, forming a "ladder track."[5]

There are three main components to any split switch: The switch rails, switch rods, and switch plates.[6] In addition, the "frog" is essential in completing the change of tracks.

The switch rails are placed between the stock rails of the approaching track. The two inner rails move in tandem and, at the point where an approaching train first makes contact with the switch (at the ends of the switch rails known as the facing or switch points), the switch rails are set at a gauge about 4 to 5 inches narrower than the stock rails. The pair of switch rails moves so that one or the other of them is flush against one of the stock rails. If a train is approaching the switch and the right-

hand switch rail is next to the right stock rail, then the wheels on the train will catch the right-hand switch rail and follow the direction of that rail. Conversely, if the left switch rail is flush to its respective stock rail, trains will follow the path of the left switch rail.[7]

The length of the switch rails varies, but are generally some fraction of the length of a standardized rolled rail. Thirty-three foot rails, for instance, are typically cut into 11 feet, 16 feet 6 inches, or 22 feet. The D,L & W used switches of 10 feet, 15 feet, 16 feet 6 inches, 20 feet, and 30 feet in length, and of 80, 91, and 101 pound rails.[8] Generally, the length of the switch rail is determined by the speed of trains passing over the switch. In yards, trains do not travel very rapidly and, consequently, the switch rails tend to be shorter.[9] The facing points on the switch rails are rounded and tapered to about 1½ inches. The frequent impact of trains tends to wear the points out so, to slow the wearing process, the points are made of harder steel alloys.[10]

The switch rails are supported and connected by switch, or tie, rods which span the distance between the two rails. Typically, there can be 1 to 3 rods, depending on the length of the rail. The rod nearest the facing points is known as the head rod and is attached to the switch stand via a connecting rod.[11]

The switch stand consists mainly of a lever and gears that transfer the lever motion to the connecting rod. The connecting rod, which runs to the head rod, moves the switch points back and

forth as the lever is thrown. The circular motion of the lever's shaft is transmitted to the connecting rod by gears housed in a protective shell.[12]

Directly on top of the switch stand housing is an indicator of the switch's position. Shaped something like a four-pointed weather vane, this two-color target rotates with the motion of the lever. At night, lamps are used instead of targets.[13]

Switch plates are flat metal sheets that lie between the ties and rails of a switch. They protect the wooden ties from damage by the rails.[14]

The facing points are the first parts of the switch a train meets when moving through a switch. The frog is located at the point where the two tracks complete their diverging pattern. There are two kinds of frogs. The first is a spring frog which is used at points where most of the traffic rolls across the same track. The second type, the "rigid" frog, is used in yards and other places where there is heavy traffic.[15] Shaped like an "X", frogs come in varying lengths and angles. The different sizes are categorized in a numbering system, ranging from No.4 to No. 24, based on the angle of the diverging tracks. The most accepted method of numbering is calculated by taking one-half of the co-tangent of one-half of the angle of the diverging tracks.[16] The lower frog numbers corresponded to a sharper turn. Number 4 frogs are rare since only very small engines at low speeds can make such tight angles. At the other extreme, frogs rarely exceeded No. 20,

and even a No. 15 is capable of handling high speed exchanges. In steam era yards, frogs were typically No. 8 or 9.[17]

When a train approached a switch, it is said to be "facing" the switch if the switch points are reached before the frog. "Trailing" the switch means reaching the frog prior to the switch points. The speed of the trains going through switches varies with the angle of the switches and frogs. A typical rule of thumb allows the train to pass at a speed twice the frog number. For instance, with a No. 8 frog, a train can safely pass through the switch at 16 miles per hour.[18]

Since switches contain moving parts that are subjected to contact with the heavy trains, switches are generally thought of as a weak point in the track. Consequently, the preferred practice is to keep switches on the main line to a minimum. Safety also dictates avoiding placing switches on curves.[19]

D,L & W SWITCH SHOPS

In the congestion of D,L & W railroad yards, switches were occasionally run through and damaged. Sometimes the switchman could fix the damage on the spot, but at other times the switch required a replacement. The old switches would then be sent to Kingston, Pennsylvania, or after 1912 to Dover, New Jersey, where the railroad maintained its own frog and switch shop. Switch points would wear thin and could either be cut off and rounded or

have another piece of metal welded on to strengthen the old points.[20] In addition to repairs, the shop made all the frogs, switches, and switch stands used on the D,L & W. The Dover shop produced 170 frogs and 140 switches per month in the 1910s. The railroad recycled frogs and switches rather extensively and saved on the cost of materials.[21] For additional information on the D,L & W's repair and distribution of frogs and switches, see the HAER report on the Scranton yards' scrap platform, HAER No. PA-132-F.

NOTES

1.Railway Engineering and Maintenance Cyclopedia, third edition (New York: Simmons-Boardman Publishing Company, 1929), 675.

2.Leo MacLane, interview by Historic American Engineering Record team, Steamtown National Historic Site, Scranton, Pennsylvania, July 31, 1989.

3.E.E. Russell Tratman, Railway Track and Track Work, second edition (New York: The Engineering News Publishing Company, 1901), 102.

4.Charles Weiss, Practical Railway Maintenance, first edition (New York: McGraw-Hill Book Company, Inc., 1923), 132, 136.

5.D.H. Lovell, Practical Switch Work: A Hand Book for Track Foremen, tenth edition (New York: The Myron C. Clark Publishing Company, 1909), 100.

6.Railway Engineering and Maintenance Cyclopedia, second edition (New York: Simmons-Boardman Publishing Company, 1926), 257.

7.Tratman, 102, 104.

8."The Lackawanna Frog and Switch Shops," Railway Age Gazette Vol. 55 (November 21, 1913), 975-6.

9.William H. Sellew, Railway Maintenance Engineering (New York: D. Van Nostrand Company, 1915), 138.

10.Sellew, 139.

11.Weiss, 134; and Cyclopedia, 259-60.

12.Tratman, 128.

13.Weiss, 146.

14.Tratman, 104.

15.Sellew, 142-3.

16.Weiss, 141.

17.Lovell, 48-9.

18.Cyclopedia, 253, 257.

19.Weiss, 142.

20.Cyclopedia, 257.

21."The Lackawanna Frog," 976-7.

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